Blower Having a Carrying Frame

DESCRIPTION

BACKGROUND OF THE INVENTION

[Para 1] The invention relates to a blower, in particular, a backpack blower, comprising a carrying frame provided with a base plate, wherein a fan comprising a fan housing is mounted on the carrying frame. The fan housing has an intake opening that faces the base plate and is spaced from the base plate. The blower comprises furthermore an internal combustion engine for driving the fan in order to take in working air through an intake gap formed between the base plate and the fan housing and to blow out the working air through a blower tube. For preventing leaves and other debris from entering the fan housing, the intake gap is covered by a leaf shield.

[Para 2] Published patent application U.S. 2002/0174511 A1 discloses a blower having an L-shaped carrying frame. The fan arranged within a fan housing that is formed as a fan spiral is driven by an internal combustion engine whose cooling air is branched off the fan spiral. The intake opening of the fan housing is positioned so as to face the base plate and located at such a spacing to the base plate that between the fan housing and the base plate an intake gap for the working air is formed. In order to prevent leaves and similar debris from entering the intake opening of the fan housing, a filter member is provided that is positioned externally annularly about the intake gap and is comprised of a flexible belt material or a wire fabric. This filter member must be mounted externally on the blower which is a cumbersome and complex task. The effective intake cross-section of the intake gap is impaired by the physical configuration of the filter member.

SUMMARY OF THE INVENTION

[Para 3] It is an object of the present invention to provide a leaf shield of a simple configuration that is effective over an extended period of use and provides a protection means to prevent the hands of the hands of the operator from getting caught.

[Para 4] In accordance with the present invention, this is achieved in that the leaf shield is comprised of a foam material having coarse pores.

[Para 5] According to the invention, the leaf shield is thus comprised of a foam material that has a coarse pore structure and is, in particular, an open-pore foam material. The coarse-pore foam material has a plurality of air channels so that the flow resistance of the coarse-pore foam material is minimal. The plurality of air channels

allow across the surface of the intake gap a uniform intake of air so that high local intake velocities are prevented. The risk that leaves, or other debris having a large surface area, adhere to the surface of the leaf shield is thus reduced.

[Para 6] Completely filling the intake gap with the coarse-pore foam material also provides a protection means for the operator preventing accidental insertion of hands into the intake gap; additional safety measures are not required.

[Para 7] It can be expedient to provide a mechanical support structure for stabilizing the outer circumference of the leaf shield of coarse-pore foam material.

[Para 8] Preferably, the leaf shield is formed as a monolithic foam material block having a central air chamber that communicates with the intake opening of the fan housing. The monolithic foam material block has excellent stability so that the intake vacuum generated by the fan does not cause collapse of the foam material structure.

[Para 9] Preferably, the central air chamber is a cylindrical opening having a center axis that is approximately perpendicular to the intake direction of the working air. The working air flows from the surroundings approximately radially into the cylindrical air chamber and is deflected in the air chamber in the direction toward the intake opening of the fan housing. The air demand of the fan can be ensured with this arrangement in a reliable way without too high a vacuum being created within the air chamber of the leaf shield.

[Para 10] The leaf shield according to the invention is advantageously secured between the base plates and the fan housing wherein the foam material of the leaf shield fills the entire space between the base plate and the fan housing with the exception of the air chamber. In a simple way, the foam material is clamped (jammed) between the base plate and the fan housing, in particular, with positive fit.

[Para 11] The fastening screws that are provided for attachment of the fan on the support frame are advantageously configured as anti-vibration elements. The fastening screws or anti-vibration elements that connect the base plate and the fan housing to one another penetrate advantageously the foam material of the leaf shield so that in this way the positive fit (positive engagement) is produced. Relative to the circumference of the air chamber, two fastening screws are positioned approximately diametrically opposed to one another so that the dimensional stability of the air chamber is ensured even at high intake vacuum (suction) of the fan. Advantageously, about the circumference of the air chamber several fastening screws are arranged, in particular, four fastening screws, that are positioned at approximately identical circumferential spacing relative to one another.

BRIEF DESCRIPTION OF THE DRAWING

[Para 12] Fig. 1 is a schematic side view of a blower according to the present invention.

[Para 13] Fig. 2 is a top view of the leaf shield according to the present invention.

[Para 14] Fig. 3 is section of the leaf shield along the section line III-III of Fig. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[Para 15] The blower 1 illustrated in a side view in Fig. 1 is a backpack blower that can be secured by straps 2 on the back of an operator (not illustrated). Such a blower can also be mounted on a vehicle or carriage or can be used in other ways.

[Para 16] The blower 1 is secured on a carrying frame 7. The carrying frame 7 is comprised of a base plate 5 and a support member 6; the base plate 5 and the support member 6 are arranged relative to one another in the form of an L, as shown in the side view of Fig. 1 of the illustrated embodiment.

[Para 17] The blower 1 has a fan comprising a fan housing 4 formed advantageously as a fan spiral. The fan is driven by a drive motor 3 that is preferably an internal combustion engine, for example, a two-stroke engine or a four-stroke engine.

[Para 18] The fan (fan housing 4) is secured by fastening screws 17, preferably embodied as vibration dampers, on the carrying frame 7. The intake opening 9 of the fan housing 4 is facing the base plate 5 wherein the intake opening 9 has a spacing a relative to the base plate 5. Because of this spacing or distance a between the fan housing 4 and the base plate 5, an intake gap 8 is formed via which working air 10 flows to the intake opening 9 in the blower housing 4, preferably from all sides. The sucked-in working air 10 exits the blower housing 4 via blower tube 11. The blower tube 11 in the illustrated embodiment is guided by the operator carrying the blower.

[Para 19] Since in operation leaves and other debris having a large surface area are swirled into the air in the surroundings of the blower, it must be ensured that no leaves or debris can enter the intake opening 9 of the fan housing 4. Leaves or debris could lead to plugging of the flow path of the working air 10 which, in turn, could lead to cooling problems of the engine when the blower is equipped with an air-cooled combustion engine.

[Para 20] In order to protect the blower from leaves and debris being sucked in, a leaf shield 12 is arranged in the intake gap 8 between the fan housing 4 and the base plate 5. The leaf shield 12 is comprised of a coarse-pore and open-pore foam material. Such foam material is comprised, for example, of polyurethane and fills the flow cross-section of the intake gap completely. Since the coarse-pore, particularly open-pore, foam material has a plurality of flow paths or flow passages as a result of

its structure, its flow resistance is minimal. The flow of sucked-in working air 10 is impaired only minimally by the coarse-pore foam material. Accordingly, the flow velocity at the surface of the leaf shield is minimal so that adherence of leaves or other large surface area debris on the surface of the leaf shield by suction forces is counteracted. Because of the coarse-pore structure a sufficient air intake is ensured wherein the leaf shield 12 is preferably configured as a monolithic block of foam material that has an approximately central air chamber 14. The air chamber 14 is arranged such that it is connected directly to the intake opening 9 of the fan housing 4. The foam material block 13 fills - with the exception of the air chamber 14 - the entire space between the fan spiral housing 4 and the base plate 5 of the support frame 7.

[Para 21] The central air chamber 14 is formed as a cylindrical opening 15 having an inner diameter D that matches approximately the intake diameter A of the intake opening 9 in the fan housing. In the illustrated embodiment, the center axis 16 (Fig. 3) of the cylindrical opening 15 is approximately perpendicular to the intake direction of the working air 10. Accordingly, the working air 10 flows approximately radially into the air chamber 14 and changes its flow direction within the air chamber 14 so as to flow toward the intake opening 9.

[Para 22] As mentioned above, the foam material of the leaf shield 12 fills - with the exception of the air chamber - the entire space between the base plate 5 and the fan housing 4. In this connection, the leaf shield 12 is secured between the base plate 5 and the fan housing 4. For example, the foam material can be clamped or jammed between the base plate 5 and the fan housing 4.

[Para 23] In the illustrated embodiment, the foam material is secured with positive fit between the base plate 5 and the fan housing 4. For this purpose, the fastening screws 17 arranged between the base plate 5 and the fan housing 4 penetrate the foam material or the foam material block 13 of the leaf shield 12. Relative to the circumference of the air chamber 14, two fastening screws 17 are positioned diametrically opposed to one another; the foam material block 13 has matching through openings 18 for the fastening screws 17. In the illustrated embodiment four fastening screws 17 are arranged such that they are positioned about the circumference of the air chamber 14 at approximately identical circumferential spacing u relative to one another.

[Para 24] The foam material of the leaf shield 12 is preferably of an open-pore configuration so that the incoming working air 10 experiences as little flow resistance as possible.

[Para 25] While specific embodiments of the invention have been shown and described in detail to illustrate the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.